Return to Log Models for Procurement and Planning

Timber Measurement Society Meeting
Portland, OR
April 8, 2010

Roy Anderson
Senior Consultant
The Beck Group
Portland, OR

Services Offered:

Benchmarking Studies

Capital Planning Projects

Timber/Fiber Supply and Demand Studies

Feasibility Studies

Expert Witness

Log Procurement and Planning Models

Return to Log

What?

- The value of a given log type (size, grade, etc.) expressed in the units of log measurement, ($/mbf, $/ton, $/$M^3$)

Where?

- Mill Gate, Landing, On Stump

Why?

- Guide to price paid for logs at mill gate or on the stump
- Analysis tool for assessing various operating scenarios

Return to Log

How?

1. **Measure Revenue**

Return to Log

How?

2. Measure Associated Costs

Return to Log

Total Revenue ($/MBM)

- Mfg. Costs ($/MBM)

= Mill Gate RTL (lumber scale basis, $/MBM)

x Lumber Recovery Factor (MBM/MBF)

= Mill Gate RTL (log scale basis, $/MBF)

- Hauling Costs (log scale basis, $/MBF)

= Landing RTL (log scale basis, $/MBF)

-Logging Costs (log scale basis, $/MBF)

= Stumpage RTL (log scale basis, $/MBF

Return to Log

Log Tests

1. Sort Logs by Grade, Species, DBH, S.E.D., Length

Return to Log

Log Tests

2. Scale Logs (tons, mbf, cubic, etc.)

Return to Log

Log Tests

3. Mill Data

- Lumber Tally
- Mill Residues
- Machine Center Loadings
- Operating Costs

Lumber Tally

PRODUCT DESCRIPTION		6'	8'	10'	12'	14'	16'	
								Total percent of grade
1/2 x 6 STD		0.001131	0.001392	0.002175	0.002957	0.001015	0.003711	1.24
#3		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
1 x 4 TRIMS								
C & BTR		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
D		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2		0.000000	0.008361	0.000000	0.000000	0.000000	0.041108	8.24
SPECIAL		0.002783	0.000000	0.002703	0.002320	0.003521	0.004636	1.60
1 x 6 TRIMS								
C & BTR		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
D		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2		0.000000	0.004175	0.004929	0.004175	0.001218	0.021340	3.58
SPECIAL		0.001392	0.000696	0.002610	0.000348	0.000000	0.000928	0.60
5/4 x 4 TRIMS								
PREM		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
STD		0.000000	0.005793	0.002418	0.000000	0.000338	0.000387	0.89
SPECIAL (#3 & #4)		0.001160	0.000000	0.000242	0.000290	0.000338	0.000000	0.20
5/4 x 6 TRIMS								
PREM		0.000000	0.000290	0.000000	0.000000	0.000000	0.000000	0.03
STD		0.000000	0.027255	0.034068	0.100031	0.062918	0.310820	53.51
SPECIAL (#3 & #4)		0.000870	0.004349	0.000725	0.000870	0.000507	0.000580	0.79
2 x 4 TRIMS								
C		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
DSS		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#1		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2 PRIME/ #2 ROUGH		0.000000	0.004125	0.004129	0.005200	0.000000	0.002477	1.59
#2		0.001392	0.011329	0.011342	0.014284	0.003246	0.006804	4.84
SPECIAL		0.000232	0.001545	0.000387	0.000000	0.000000	0.000000	0.22
2 x 6 TRIMS								
C & BTR		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
DSS		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#1		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2 PRIME/ #2 ROUGH		0.000070	0.002997	0.003746	0.012081	0.000000	0.004121	2.30
#2		0.000278	0.011848	0.014810	0.047763	0.015425	0.016291	10.64
SPECIAL		0.000000	0.000464	0.000580	0.001392	0.000000	0.000000	0.24
2 x 8 TRIMS								
C & BTR		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
DSS		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#1		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2 PRIME/ #2 ROUGH		0.000000	0.002012	0.003868	0.008356	0.001083	0.001857	1.72
#2		0.000000	0.006031	0.011592	0.025045	0.003247	0.005565	5.15
SPECIAL		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
2 x 10 TRIMS								
SCAFFOLD		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#1		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2 PRIME		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
SPECIAL		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
2 x 12 TRIMS								
C & BTR		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#1		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2 PRIME		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
#2		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
SPECIAL		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
4 x 4 #2		0.000000	0.011137	0.008503	0.006495	0.000000	0.000000	2.61
#3		0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
								100.00

Mill Residue Production


Bark


Chips


Planer Shavings


Sawdust

Machine Center Loadings

	Stem DBH	10"	12"	14"	16"	18-20"
	Timber Type	Natural	Natural	Natural	Natural	Natural
Head Rig	BLOCKS/MIN				0.99	0.88
Quad	BLOCKS/MIN	6.23	5.46	4.18	4.10	3.90
Gang	PCS/BLOCK	1.03	1.02	1.00	1.01	0.97
Edger	PCS/BLOCK	2.16	2.65	3.67	3.87	4.71
Trimmer	PCS/BLOCK	5.11	6.16	8.55	9.94	8.78

Breakdown of variable and fixed costs

Period: Jan 1- June 30, 2007

Department

Cost Description	Type	Forestry	Sawmill	Kilns	Stacker	Planer
GAS - TRUCKS & CARS	F	$ 2,752	$ 3,086			$ 1,200
FUEL - FORK LIFTS	M	$ 3,161	$ 14,245	$ 7,705	$ 1,268	$ 8,795
OIL - LIFTS AUTO	M		$ 11,453			$ 457
HYDRAULIC OIL	M					
WORKS' COMP PREVENTION	H		$ 820			$ 1,581
INSURANCE-AUTO	F	$ 690	$ 690	$ 345		
INSURANCE-WCI	F	$ 651	$ 22,058	$ 1,561	$ 1,374	$ 8,321
INSURANCE-GROUP	F	$ 2,340	$ 33,000	$ 4,680	$ 4,680	$ 15,000
SUPERVISION	F		$ 17,006	$ 42,726		$ 44,829
LABOR	H	$ 50,612	$ 338,150	$ 29,368	$ 20,856	$ 193,767
OVERTIME LABOR	H	$ 5,203	$ 188,038	$ 11,406	$ 10,883	$ 82,886
BONUS	F		$ 16,440	$ 854	$ 480	$ 6,849
VACATION PAY	F		$ 1,614		$ 210	$ 2,016
HOLIDAY PAY	F		$ 1,522	$ 74	$ 70	$ 954
SICK PAY	F					
LEASE	F					$ 1,858
MISCELLANEOUS	F					
TIMBER PRODUCT INSPECTION	M					
OIL FOR QUAD	M		$ 11,178			
REPAIRS-TIRES	M	$ 1,588	$ 3,720	$ 1,484		
REPAIRS-LIFTS	M	$ 7,453	$ 30,598	$ 16,899		$ 654
REPAIRS/SUPPLIES	M	$ 28,024	$ 1,819,914	$ 55,373		$ 102,611
NEW SAW PURCHASE	M		$ 20,524			$ 2,868
REPAIRS-IKS KNIFE SHARPEN	M		$ 14,087			$ 678

Return to Log Values

WEST COAST PINE	LOG DIAMETER 6-7	8-9	10-12	13-16	17-20	21+
SALES REALIZATION						
Lumber ($/MBM)						
Gross	$ 406.92	$ 433.07	$ 497.25	$ 645.64	$ 775.49	$ 885.46
Less: Discount	$ (4.07)	$ (4.33)	$ (4.97)	$ (6.46)	$ (7.75)	$ (8.85)
Net	$ 402.85	$ 428.74	$ 492.28	$ 639.19	$ 767.74	$ 876.60
By Products						
Chips	$ 26.26	$ 18.18	$ 16.99	$ 16.90	$ 21.68	$ 19.62
Shavings	$ 4.76	$ 4.75	$ 4.73	$ 4.71	$ 4.69	$ 4.68
Sawdust	$ 2.50	$ 1.95	$ 1.86	$ 1.53	$ 1.41	$ 1.44
Hog Fuel	$ 0.67	$ 0.69	$ 0.81	$ 0.96	$ 1.06	$ 1.17
Sub-total	$ 34.19	$ 25.56	$ 24.40	$ 24.10	$ 28.84	$ 26.91
TOTAL	**$ 437.04**	**$ 454.30**	**$ 516.68**	**$ 663.29**	**$ 796.58**	**$ 903.51**
MANUFACTURING COSTS						
Log Yard ($/MBM)	$ 26.94	$ 21.76	$ 20.35	$ 17.08	$ 16.16	$ 16.70
Sawmill	$ 109.98	$ 85.13	$ 73.35	$ 52.39	$ 43.69	$ 41.87
Dry Kilns	$ 6.80	$ 7.07	$ 8.08	$ 10.55	$ 12.07	$ 13.11
Planer	$ 31.43	$ 24.72	$ 20.38	$ 16.16	$ 14.83	$ 14.50
Shipping	$ 18.72	$ 15.37	$ 13.78	$ 10.95	$ 9.78	$ 9.53
Plant General	$ 9.50	$ 7.22	$ 6.14	$ 4.21	$ 3.41	$ 3.24
TOTAL	**$ 203.37**	**$ 161.26**	**$ 142.07**	**$ 111.34**	**$ 99.95**	**$ 98.95**
GROSS CONVERSION RETURN	$ 233.68	$ 293.04	$ 374.61	$ 551.95	$ 696.63	$ 804.56
Administrative Costs ($/MBM)	$ 16.87	$ 12.59	$ 10.57	$ 6.96	$ 5.46	$ 5.14
Log Procurement	$ 5.87	$ 4.38	$ 3.67	$ 2.42	$ 1.90	$ 1.79
Depreciation	$ 35.32	$ 26.36	$ 22.12	$ 14.56	$ 11.42	$ 10.77
Interest	$ 2.21	$ 1.65	$ 1.38	$ 0.91	$ 0.71	$ 0.67
Corporate Fees	$ 9.84	$ 7.35	$ 6.16	$ 4.06	$ 3.18	$ 3.00
NET CONVERSION RETURN	$ 163.56	$ 240.71	$ 330.71	$ 523.04	$ 673.95	$ 783.19
Lumber Recovery (MBM/MBF)	1.711	1.663	1.401	1.193	1.071	0.974
Return to Log ($/MBF)	**$ 279.91**	**$ 400.20**	**$ 463.29**	**$ 624.12**	**$ 721.58**	**$ 762.51**
Desired Profit Margin ($/MBF)	$ 89.75	$ 90.64	$ 86.86	$ 94.98	$ 102.34	$ 105.56
Allowable Log Cost	**$ 190.16**	**$ 309.56**	**$ 376.43**	**$ 529.14**	**$ 619.24**	**$ 656.95**
Combined Averages	**$251.29**		**$458.24**		**$637.87**	

Return to Log Values

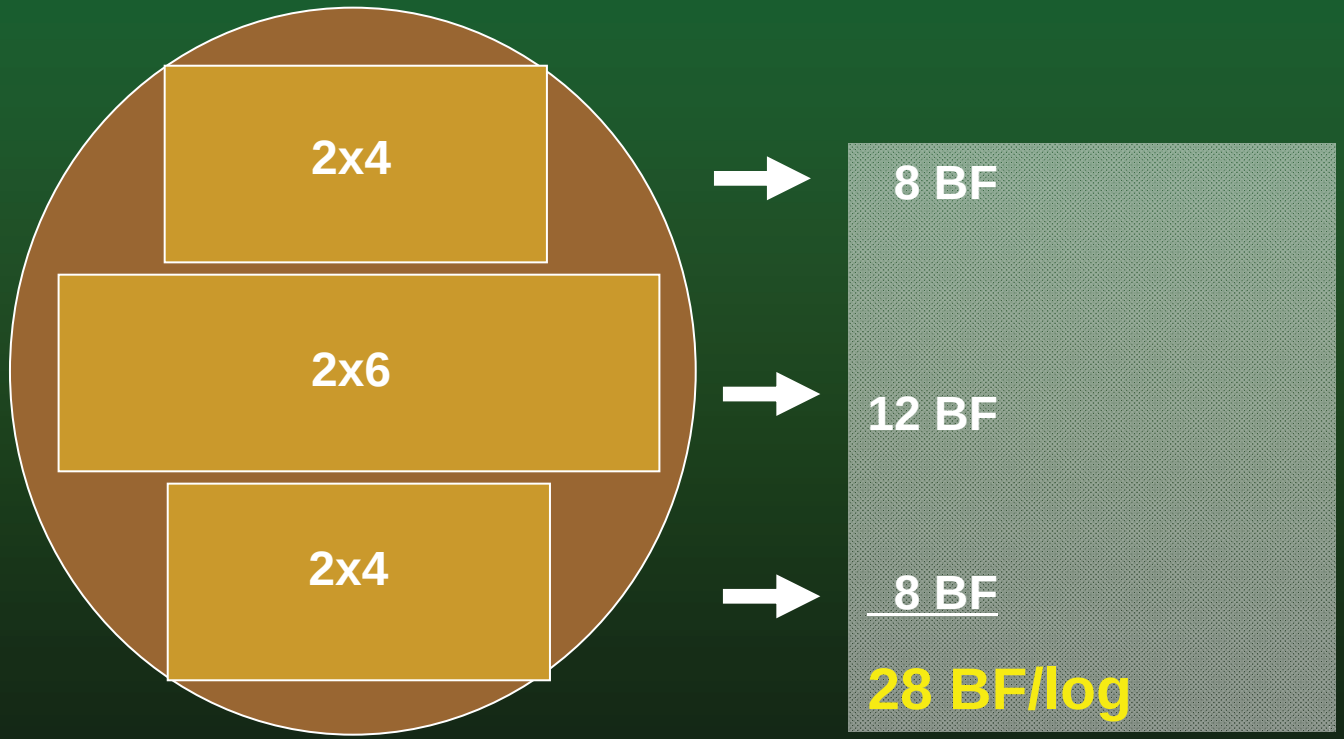
SOUTHERN YELLOW PINE	LOG DBH 10" N	12" N	14"N	16"N
SALES REALIZATION ($/mbf)				
Gross (Lumber)	399.47	497.59	477.76	506.81
Less: Discount	(3.40)	(4.23)	(4.06)	(4.31)
SUBTOTAL	**396.07**	**493.36**	**473.70**	**502.50**
By Products				
Mixed Fuel ($/mbf)	1.05	1.05	1.05	1.05
Chips ($/mbf)	47.90	45.78	41.49	36.09
Sawdust ($/mbf)	4.15	4.15	4.15	4.15
Bark ($/mbf)	4.03	4.44	4.17	3.47
Shavings ($/mbf)	8.87	8.87	8.87	8.87
SUBTOTAL ($/mbf)	**66.00**	**64.29**	**59.73**	**53.64**
NET SALES REALIZATION ($/mbf)	**462.07**	**557.65**	**533.43**	**556.14**
MANUFACTURING COSTS ($/mbf)				
Forestry	4.53	4.35	4.21	3.80
Sawmill	103.56	101.05	99.20	93.33
Kilns	9.91	10.15	10.16	10.04
Stacker	1.79	1.68	1.61	1.37
Planer	39.80	37.20	33.43	30.69
Quality Control	0.52	0.51	0.50	0.48
Maintenance	11.01	10.47	10.07	8.80
Sales & Shipping	3.06	2.91	2.80	2.44
SUBTOTAL	**174.18**	**168.33**	**161.98**	**150.94**
GROSS CONV. RET. ($/mbf)	**287.89**	**389.33**	**371.45**	**405.20**
General & Admin	42.94	40.45	38.60	32.76
NET CONVERSION RET. ($/mbf)	**244.95**	**348.88**	**332.85**	**372.43**
YIELD				
Tons/MBF	4.47	4.30	4.35	4.08
RETURN TO LOG				
$/Ton	**54.84**	**81.08**	**76.54**	**91.18**
DESIRED PROFIT MARGIN ($/ton)	4.48	4.65	4.60	4.90
ALLOW. DELIV. LOG COST ($/ton)	**50.36**	**76.43**	**71.94**	**86.28**

Why such a big difference in Manufacturing cost?

6.5” SED

7.5” LED

12’ length

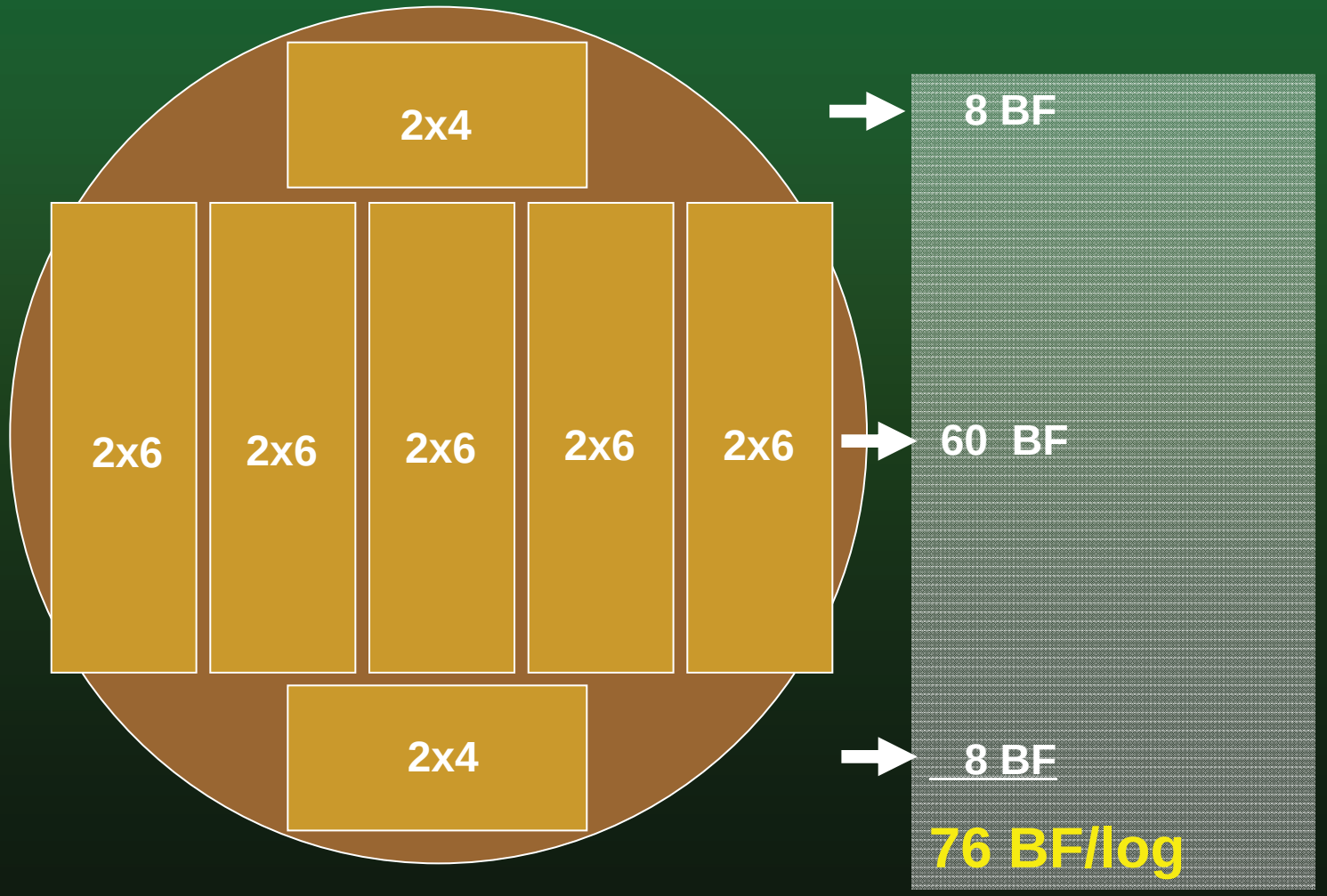


Why such a big difference in Manufacturing cost?

10” SED

11” LED

12’ length



Why such a big difference in cost?

- Both logs pass through the primary breakdown at the same speed
- The larger log yields almost 3x the lumber
- In addition to cost difference, larger diameter logs generally yield higher value lumber grades

Uses of This Information

- Log Procurement Planning Tool
  - Allowable log cost for a stand of timber/log deck
  - Identify best log for a mill
  - What if scenario’s
- Objective Valuation of a Tract of Timber
  - Transfer pricing

Summary

- RTL a tool for looking at the value of a given log type
- Computer Model based on Revenues, Manufacturing Cost, & Recovery
- In general, log value increases with log diameter
- Caused by more lumber volume per linear through put (higher production) and higher value products
- Our clients have used the models for a number of purposes

Questions?